

Two species of *Peristylus* Blume (Orchidaceae), new additions to the flora of Goa, Western Ghats, India^a

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Abstract

Peristylus aristatus and *Peristylus stocksii* are reported for the first time to Goa state. Detailed descriptions and photographs, for easy identification, as well as information about phenology, distribution and habitat are provided.

Résumé

Deux espèces de *Peristylus* Blume (Orchidaceae) nouvellement ajoutées à la flore de Goa, Ghats occidentaux, Inde – *Peristylus aristatus* et *P. stocksii* sont enregistrés pour la première fois dans l'état de Goa. Une description détaillée et une planche d'illustrations, pour faciliter l'identification, ainsi que des informations sur la phénologie, la distribution géographique et l'habitat, sont données pour chacune des deux espèces.

Introduction

Peristylus Blume is a genus of about 70-75 species of terrestrial orchids (Pridgeon *et al.*, 2001) distributed throughout eastern Asia, South-east Asia, the Malay Archipelago, north-eastern Australia, the Philippines, and the south-western Pacific Islands. The generic name is derived from the Greek *peri*, around, and *stylos*, column, in reference to the column arms on each

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side of the column. The general morphology of the genus is very similar to that of *Habenaria* Willdenow and *Pecteilis* Rafinesque. The differences between both genera have been debated to some extent (Seidenfaden, 1977). In vegetative condition it is difficult to differentiate the two genera but recent taxonomic judgments support the retention of the genus *Peristylus*. The major differences are in column structure. In *Peristylus* sessile stigmatophores are reduced and fused to the labellum base and column appendage, whereas in *Habenaria* the stigmatophores are stalked and free from the lip base.

About 31 species and two varieties have been recorded from India (Misra, 2007; Kumar *et al.*, 2010; Karthigeyan *et al.*, 2010), of which 11 species are distributed throughout the Western Ghats which form, in Peninsular India, an important biogeographical zone consisting of a series of hill ranges running north-south along the west coast of India. In Goa the Western Ghats region runs along the eastern length of the state and consists of a wide belt of rich forest with abundant biodiversity. The inaccessibility of the Goa region causes it to be poorly explored in respect to orchid diversity and the entire Western Ghats are now under protection in this State. The present study is a part of an ongoing project by the Botanical Survey of India to assess the orchid diversity of this Protected Area.

Material and methods

An orchid survey was conducted in Madei Wildlife Sanctuary during August 2015. It is located in the Sattari taluka of North Goa district. The wildlife sanctuary stretches over an area of 208 km². The topography is undulating and hilly, and altitude ranges from 50 m to 1027 m above sea level. A major portion of the sanctuary is dominated by tropical evergreen and tropical semi-evergreen forests. The annual rainfall averages 2500 mm whereby the wettest period is from June through September.

During the survey we encountered two small populations of terrestrial orchids growing under the partially open evergreen forests in different locations. Fresh samples of plants were collected and preserved for further study. The plants were identified using the pertinent literature (Santapau & Kapadia, 1966; Saldanha, 1976; Abraham & Vatsalla, 1981; Jayaweera, 1981). The collected specimens were deposited in the Herbarium of the Botanical Survey of India, in Pune (BSI).

Results

These orchids were identified as *Peristylus aristatus* Lindley and *Peristylus stocksii* (J.D.Hooker) Kraenzlin. Hitherto, only two species of *Peristylus* have been reported from Goa state (Vartak, 1966; Rao, 1985-86; Naithani *et al.*, 1997; Karthikeyan, 2000; Jalal & Jayanthi, 2012; Datar & Lakshminarasimhan, 2013). The present report adds two more species to the flora of the region. A detailed description along with photographs of the dissected plant parts of each species is provided in this article, as well as a simple identification key covering the four species of *Peristylus* now known to occur in Goa state.

Artificial key to species of *Peristylus* in Goa

- 1a. Spur subclavate-----2
- 1b. Spur globose-----3
- 2a. Leaves narrowly lanceolate, lateral lobes of lip linear oblong---*P. densus*
- 2b. Leaves broadly obovate-elliptic, lateral lobes of lip broad rounded-----
-----*P. stocksii*
- 3a. Flowers green, lip deeply 3-lobed-----*P. aristatus*
- 3b. Flowers white, lip obscurely 3-lobed-----*P. plantagineus*

Taxonomic descriptions

Peristylus aristatus Lindley, *The Genera and Species of Orchidaceous Plants*: 300 (1835); Abraham & Vatsala, *An Introduction to Orchids*: 246 (1981); P.Lakshminarasimhan in B.D.Sharma *et al.*, *Flora of Maharashtra: Monocotyledon*: 55 (1996).

Type: Sri Lanka, *J. Macrae* 56 (K).

Peristylus exilis R. Wight, *Icones Plantarum Indiae Orientalis* 5: t. 1698 (1852).

Type: India, Pulney, *Wight sn* (K)

Terrestrial herbs, 22-40 cm tall; leaves 5, clustered at the middle of stem, 3-5 × 2-2.5 cm, ovate-lanceolate, acuminate, acute, membranous, 5-nerved, base and petiole sheathing the stem; inflorescence 8-18 cm long, erect, lax-flowered, slender, erect, with few sterile bracts; flowers pale green, 4-6 mm across; bracts 4 × 2 mm, ovate, acuminate, acute, 1-nerved, slightly shorter than ovary; sepals sub-equal, dorsal sepal oblong-ovate or lanceolate, 2.5 × 1.5 mm, obtuse, 1-nerved, lateral sepals obliquely obovate-lanceolate, obtuse or rounded, 1-nerved; petals 3 × 1.6 mm, ovate, obtuse, appressed to

the dorsal sepal, concave forming a hood over the column; lip 5-6 mm, much longer than the sepals, clawed, 3-lobed, lateral lobes filiform and falcately incurved, midlobe shorter and broader, tongue like, rounded; spur globose, 4 mm long; column ca. 1 mm high; ovary 10 mm long. Fig. 1.

Flowering: July-September.

Habitat: Found in shaded areas of semi-evergreen forests at 600 to 700 m.

Distribution: India (Maharashtra, Goa [present record], Karnataka, Kerala and Tamil Nadu), Sri Lanka. Endemic to the Western Ghats of India and Sri Lanka.

Specimen examined: India: North Goa, Madei wildlife Sanctuary, near Surla village (N 15° 39' 50.66" E 74° 10' 02.08"), Alt. 764 m, 22.08.2015, J.S. Jalal 203629 (BSI).

Peristylus stocksii (J.D.Hooker) Kraenzlin, *Orchidacearum Genera et Species* 1: 513 (1898); Santapau & Kapadia, *The Orchids of Bombay*: 48 (1966); P.Lakshminarasimhan in B.D. Sharma *et al.*, *Flora of Maharashtra: Monocotyledon*: 58. 1996. *Habenaria stocksii* J.D. Hooker, *The Flora of British India* 6: 158 (1894).

Type: India, Mysore, *Stocks* 173 (K).

Terrestrial herbs, 25-30 cm high; tubers 1-2, oblong or ellipsoidal; stems slender, sheathed; leaves more or less clustered at the middle of stem, variable, 4-10 × 2-4 cm, obovate-elliptic, obtuse, acute, usually petiolate, margins wavy, 5-nerved; inflorescence lax, many-flowered, secund, 10-20 cm long, peduncle 5-10 cm long, slender, with a few bracts which are scaly, ovate, acute, and 1-nerved; flowers small, yellowish-green, sessile, bracteate; bracts 1.2 × 0.3 cm, more or less equalling the ovary, ovate, acuminate, glabrous, 1-nerved; sepals subequal, green, glabrous, dorsal sepal 3 × 2 mm, concave, forming a hood over the column with petals, elliptic-oblong, lateral sepals 2.5-3 × 1.5-2 mm, spreading, obliquely oblong, obtuse; petals 2.5 × 2 mm, green, sub-fleshy, sub-obliquely ovate-oblong, obtuse or sub-retuse, entire, glabrous; lip 3 × 4 mm, green, longer than the lateral sepals, 3-lobed, clawed, claw 2 mm broad, concave, lateral lobes narrower than the midlobe, incurved, oblong, obtuse, entire, midlobe straight, oblong, obtuse, entire; spur 6 mm long, green, shorter than ovary, obtuse, inflated downwards; column very small, green, obtuse; pollinia 2, yellowish, clavate, obovate-oblong with a short caudicle. Fig. 2.

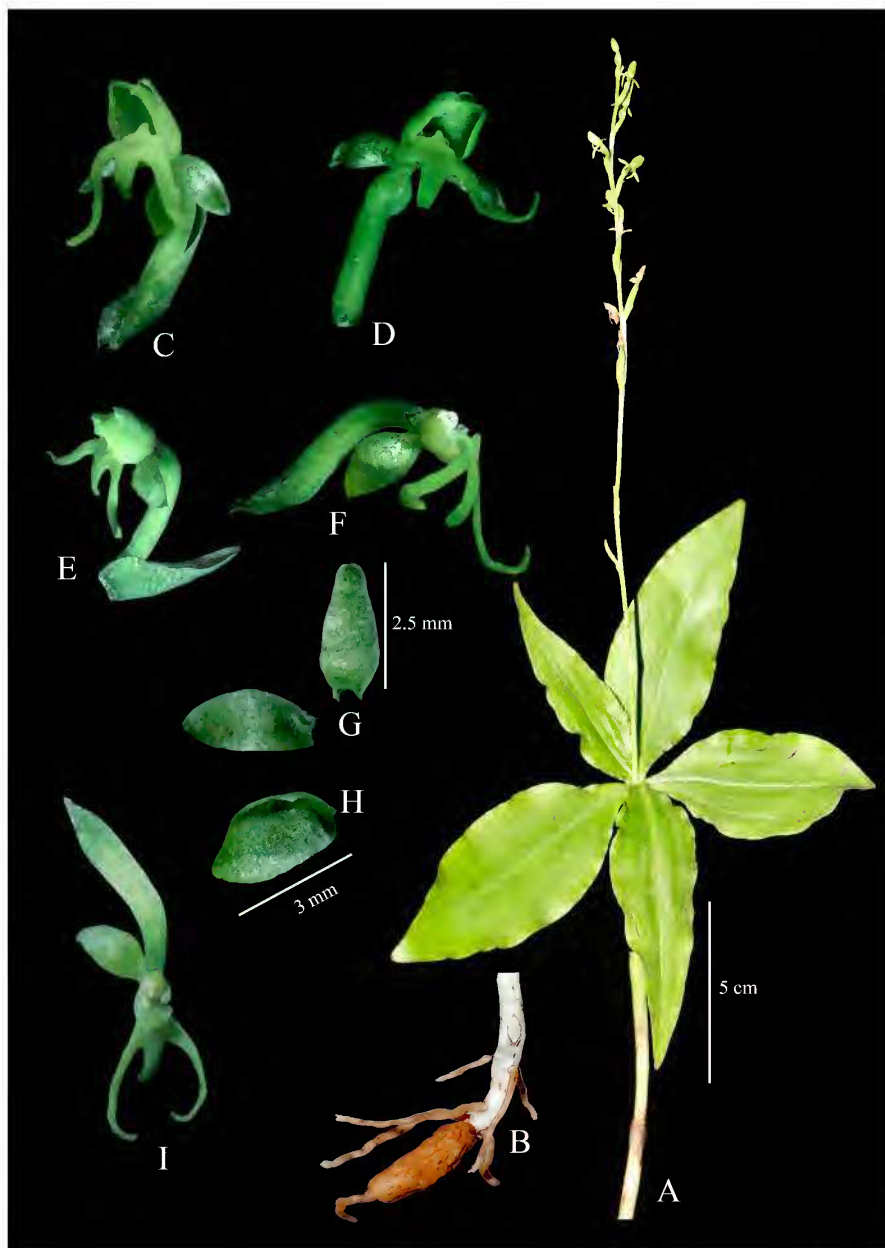


Fig. 1: *Peristylus aristatus* Lindley

A. Habit, B. tuber, C-E. different views of a flower, F. ovary, spur & lip, G. sepals, H. petal, I. View of column, lip, ovary & spur.

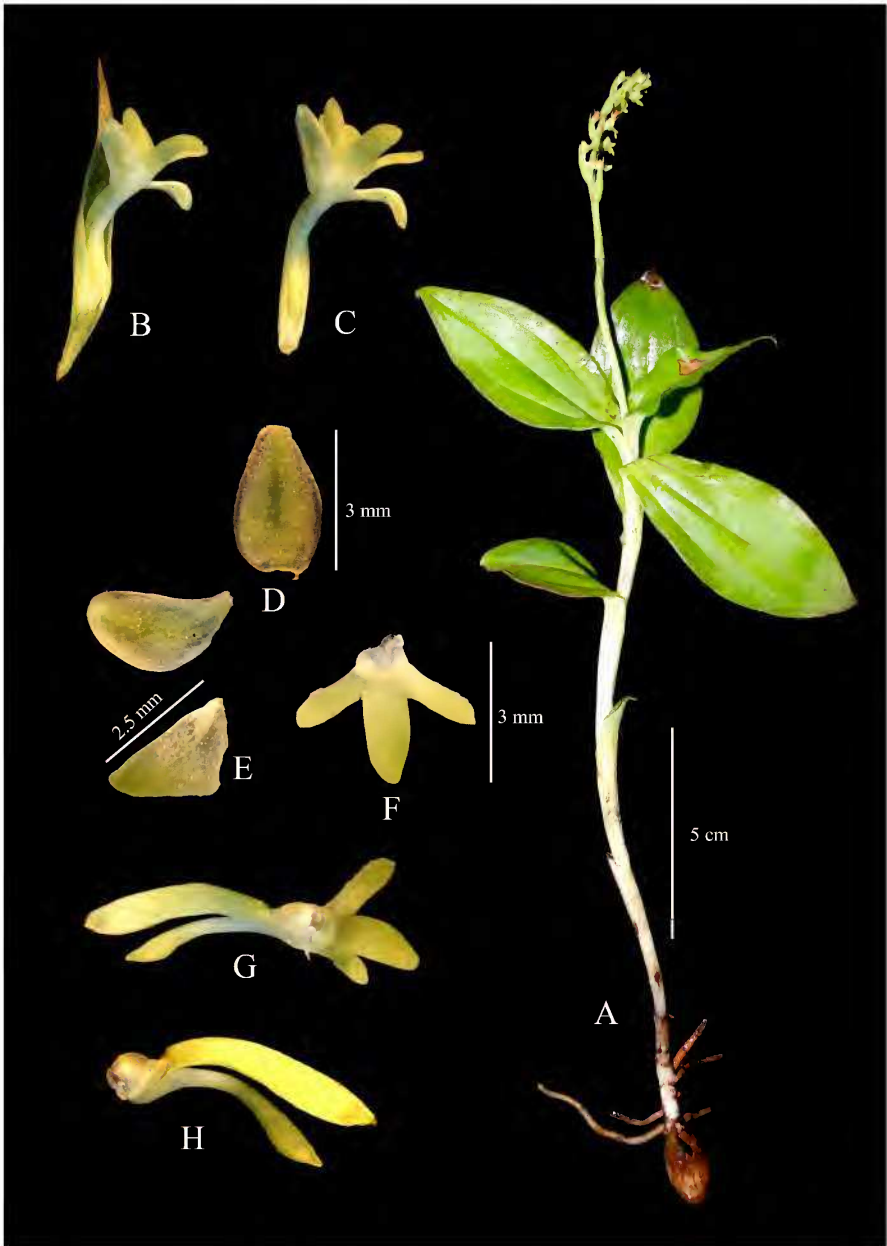


Fig. 2: *Peristylus stocksii* (J.D.Hooker) Kraenzlin

A. Habit, B-C. different views of a flower, D. sepals, E. petal, F. lip, G. ovary, spur & lip, H. spur, ovary & column.

Flowering: July-September.

Habitat: Found in the shade of semi-evergreen forests at 800 m altitude. It grows on the moderately open plateaus under small bushes, along forest edges and road sides.

Distribution: India (Rajasthan, Gujarat, Maharashtra, Goa [present record], Karnataka and Tamil Nadu). Endemic to the Western Ghats.

Specimen examined: India: North Goa, Madei wildlife Sanctuary, Surla plateau (N 15° 39' 55.71" E 74° 10' 18.78"), Alt. 818 m, 20.08.2015, *J.S. Jalal 203646* (BSI).

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